

Learning Activity 3

Students will begin the activity by reviewing what multiplication means. The teacher will model how to solve an example decimal multiplication problem using the following strategies: base ten blocks, a table/list of smaller values, fraction multiplication, and a picture. Students will then be given their own problem to solve and ask to show the solution using at least two of the different methods or the traditional algorithm, if students know it already. Each strategy will be presented to the class. While each solution is being presented, the backchannel, Today's Meet, will be accessible to students on their class set of iPods. Students will be encouraged to ask questions, post similarities between the strategies, and make comments on the presentations using the back channel. Between each presentation, we will address questions or comments made on the backchannel. At the end of the lesson, we will discuss how the traditional algorithm is connected to all the different models. Practice problems will be given for homework.

During this activity, students will be in the classroom. We will begin the lesson on our class carpet in front of the Smartboard. After the modeling is completed by the teacher, students will return to their tables and work with partners to solve the decimal multiplication problem. At the end of the lesson, we will return to the carpet to examine the strategies while students have the iPods in their hands.

In order for the students to be successful with the backchannel, they must understand the purpose and how to use the backchannel. We will discuss the purpose of a backchannel as allowing others to hold an online conversation about what is being presented without interrupting the presenter. It is important that students understand how to access the website and how to post a comment. It is also important to discuss the netiquette of using a backchannel. Positive comments should be posted. Relevant questions should be asked. Students should know that the topic should stay on the math being presented and that text language is appropriate for this technology.

Learning objective

The learner population for this activity is 6th graders who are familiar with decimals and have experiences with adding and subtracting decimals. The standard addressed in this lesson is understanding how to multiply multi-digit decimals and showing multiple representations of the math. As a result of this activity, students should understand how to solve any decimal multiplication problem and show more than one representation of that problem.

Technology Integration

The activity will be enhanced by the use of the backchannel for several reasons. First, the backchannel will allow students a forum to speak without interrupting the speaker. Students can ask questions while they arise instead of waiting for the speaker to finish. Students may also notice that many other students have the same question and next time, be more confident in asking questions. Second, the backchannel will allow the quiet or not so confident child to ask a question or make a comment in a comfortable, safe environment. Third, the back channel is a way for the class to keep track of similarities noted or comments made and use those ideas to look for patterns to connect to the traditional algorithm. Fourth, the backchannel allows for students to decide what was important in the presentations. If a comment is posted or reposted more than once, it might be considered an important idea learned from that presentation. Lastly, the backchannel allows every student to have a voice and not be concerned that someone else is saying the comment. For example, many students can have the same idea but once one person shares it out loud, many students drop their hands. With the backchannel, it is encouraged for students to repost something they feel is important.

The backchannel causes the teacher to no longer be the moderator of a discussion. The students have an online discussion without the teacher deciding who shares and deciding what needs to be restated.

The backchannel allows the students to lead the discussion. The teacher can facilitate the discussion afterwards of any patterns or unanswered questions on the backchannel.

Students will be supported throughout the lesson in several ways. First, students will be given the necessary introduction to the technology including what the website is and how to enter comments or questions on the backchannel. There is also a tech support person (a student job) in our class that students can quietly ask while using the backchannel. I will ask this tech support person to join me for lunch the day before to make sure she has the necessary experiences to help troubleshoot the technology.

Connection to Standards

This learning activity will address the Common Core State Standard of students fluently adding, subtracting, multiplying, and dividing multi-digit decimals using the standard algorithm for each operation. One technology standard addressed in this lesson is students will use digital media and environments to communicate and work collaboratively through interactions with peers. By using the backchannel, students will use a digital environment to hold a conversation about the math. Another technology standard addressed in this lesson is students will demonstrate understanding of technology concepts and operations while using the technology. By using the backchannel, students will demonstrate an understanding of how to use the iPod to access a website and type information. They will also demonstrate an understanding of what a backchannel site is and how to use it properly. Students will also demonstrate digital citizenship by practicing legal and ethical behavior while using the backchannel. Students will exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.

Student Prior Knowledge

The discussion of the different representations of multiplication is meant to activate student prior knowledge in the lesson. By looking at student responses and listening to student comments made during

the launch of the activity, I will be able to assess what prior knowledge students bring with them. For those students who do not have the prior knowledge needed to be successful, I will make sure I visit those partners first and help them to get started by asking questions that will allow students to access the math easier. I may break the problem down in smaller pieces or a similar problem. I may refer to my models and ask students to point out where the two factors in the problem are. I may ask students to use a strategy to solve a problem we know the answer to, such as 11×15 . I would ask students to connect this problem to the decimal problem we are trying to solve.

Content Knowledge

For this lesson to be successful, a teacher must first understand what multiplication means. Multiplication is a factor times another factor to equal a product. A teacher must understand that multiplication can be thought of groups with the same number in each group, as repeated addition, or as an area model. A teacher must also understand the standard algorithm for multiplying decimals. A teacher must know how this is connected to fraction multiplication. For example, when you are counting the number of decimal places in the two factors to determine the number of decimal places in the product, you are actually using the denominator for the fraction representation of that problem. A teacher must also know what words or clues to look for in story problems that would signal multiplication for the operation.

A teacher must also understand how to show the different representations of the problem. To start, a teacher must understand how to find an estimate and use it to gauge if a final solution is correct. The teacher must understand how to use base ten blocks to show decimal multiplication. For example, if a flat represents one whole, then a rod must represent one tenth. If the problem is 1.7×0.50 , then one whole times 0.5 would be 0.50 and 0.1 times 0.5 would be .05, making 0.7 be 0.35 (7 one tenths). Therefore, the solution would add up to 0.85 (one whole plus seven tenths). A teacher must understand how to use a picture to represent a decimal multiplication problem using grid paper. In addition, a teacher must know

how to make a table of values so a student could use simpler problems and look for patterns to find the answer. Using the example from above, a student could start by listing $1 \times 0.50 = 0.50$, $2 \times 0.50 = 1.00$ because you doubled the previous answer, $1.5 \times 0.5 = 0.75$ because you went halfway between 0.50 and 1.00, $0.1 \times 0.5 = 0.05$ because it is one tenth of 0.50, so finally a student could add the results of 1.5×0.50 , 0.1×0.5 , and 0.1×0.5 to get the final answer.

Pedagogical Knowledge

In this activity, I choose to work with the multiple representations instructional technique. I felt this works best because multiplying can be shown in so many different ways and it is one of the Common Core mathematical practices. Students have seen multiple representations of multiplying in the lower grades and are used to learning different methods to solve a multiplication problem (i.e. partial products, lattice, traditional algorithm, repeated addition, pictures). Using these prior experiences from the lower grades, students have a foundation to build from and connect to. In addition, by using multiple representations students can choose one that fits their learning style. Some students are visual learners and need the picture. Some are kinesthetic learners and need the base ten blocks.

By asking the students to solve the problem using at least two methods, I am asking students to model with mathematics and attend to accuracy and precision. By using these two Common Core mathematical practices, students better understand the mathematics that is presented to them. If the same answer is arrived at both times, then students know they have used the representations correctly. In addition, students can compare strategies to start to get at the heart of the mathematics.

Technology Knowledge

In order to use the backchannel in this lesson, a teacher must first know how to create a backchannel on www.todaysmeet.com. A teacher must also know how to allow students to access this site. There are

several ways a teacher could do this: post the website, create a link of a class wiki/website, or create a QR code. A teacher must understand the function of a backchannel as a way to have an online conversation in the background of a presentation. A teacher must know how to project the backchannel on a screen when the presentation is finished. Lastly, a teacher must know how to enter text on a backchannel and how to access the entire conversation.

Knowledge about the iPod Touch is also essential to this activity. A teacher must know how to turn on the iPod, access Safari, and if using a QR code, how to access a QR code reader. The teacher must understand how to type information on the iPod Touch using the keyboard. A teacher must understand how the wireless internet is connected to the iPod. Finally, a teacher must understand how to operate Safari and access websites using Safari.

TPACK Analysis

By teaching multiplying decimals using multiple representations with the support of a backchannel, I feel that students will have better access to the actual mathematics and have a better understanding as to why the traditional algorithm arrives at the correct answer each time. I also believe students will increase their understanding of place value using these choices. As mentioned before, multiplying lends itself easily to showing multiple representations and allows students to see connections to place value and addition. I have used multiple representations in the past and had much success. All students got to work right away and felt confident in working towards a solution because of the choice built into the activity. More students felt they could share and ask questions because they understood at least one of the representations.

I chose to use the backchannel because in past years, during the presentation part of the lesson, many students lost focus. My students sometimes have difficulty listening to each other and asking questions. Some students lose focus on the presentations and others are too shy to ask questions. For example, my one class has the same five students asking questions/making comments everyday. I struggle

getting others to participate. By using the backchannel, all students can and are required to participate. The shy students can ask questions without having to speak to the entire class. Students can focus on the backchannel while listening to their classmates. Questions can occur while students are thinking of them instead of waiting until the presentation is finished. In addition, students can make connections right then instead of waiting until all presentations are finished. The backchannel allows us to have time for those comments to be made that normally we might run out of time at the end of class. In closing, the backchannel allows every student to have a voice.

Assessment Plan

I plan to have several formative assessments in this activity and one summative assessment after this activity. My first formative assessment will happen as partners work on their different methods. I will circulate the room, listen to conversations, and view work in order to gauge where the understanding is at this point. My next formative assessment will be while students are presenting. I will listen to each presentation, the questions that are asked, and view the backchannel comments to understand where students are at in their learning. Next, I will assign homework problems that ask students to use the traditional algorithm for multiplying decimals. Finally, I will have a quiz a few days later in order to have a last formative assessment for their learning. Based on these formative assessments, I will decide who needs more practice with the concept. For a summative assessment, I will have a unit test covering operating with decimals that will include multiplying decimals questions. If students can fluently multiply decimals with 85% accuracy on this assessment and students can successfully show at least two representations of a problem, then I will know my learning objectives were met.